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(54) **MODULAR INTRAOCULAR LENS DESIGNS AND METHODS**

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See application file for complete search history.

(56)

References Cited

U.S. PATENT DOCUMENTS

4,168,547 A	9/1979	Konstantinov et al.
4,409,691 A	10/1983	Levy

(Continued)

FOREIGN PATENT DOCUMENTS

EP	1 138 282 A1	10/2001
EP	1 296 616 B1	5/2012

(Continued)

OTHER PUBLICATIONS

PCT International Search Report and Written Opinion for Corresponding International Application No. PCT/US2014/037646 mailed Aug. 18, 2014 (14 pages).

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(57)

ABSTRACT

A modular IOL system including intraocular primary and secondary components, which, when combined, form an intraocular optical correction device, wherein the secondary component is placed on the primary component within the perimeter of the capsulorhexis, thus avoiding the need to touch or otherwise manipulate the capsular bag. The secondary component may be manipulated, removed, and/or exchanged for a different secondary component for correction or modification of the optical result, on an intra-operative or post-operative basis, without the need to remove the primary component and without the need to manipulate the capsular bag. The primary component may have haptics extending therefrom for centration in the capsular bag, and the secondary component may exclude haptics, relying instead on attachment to the primary component for stability. Such attachment may include actuatable interlocking members.

24 Claims, 30 Drawing Sheets

